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Harkins

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[54] **REHABILITATION APPARATUS FOR AMBULATORY PATIENTS**

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[51] **Int. Cl.**[6] **A61H 3/00**

[52] **U.S. Cl.** **482/67;** 482/68; 135/67; 297/5

[58] **Field of Search** 482/41, 51, 66–68; 434/255; 297/5, 192; 280/47.38, 87.05, 87.051, 642, 650; 135/67

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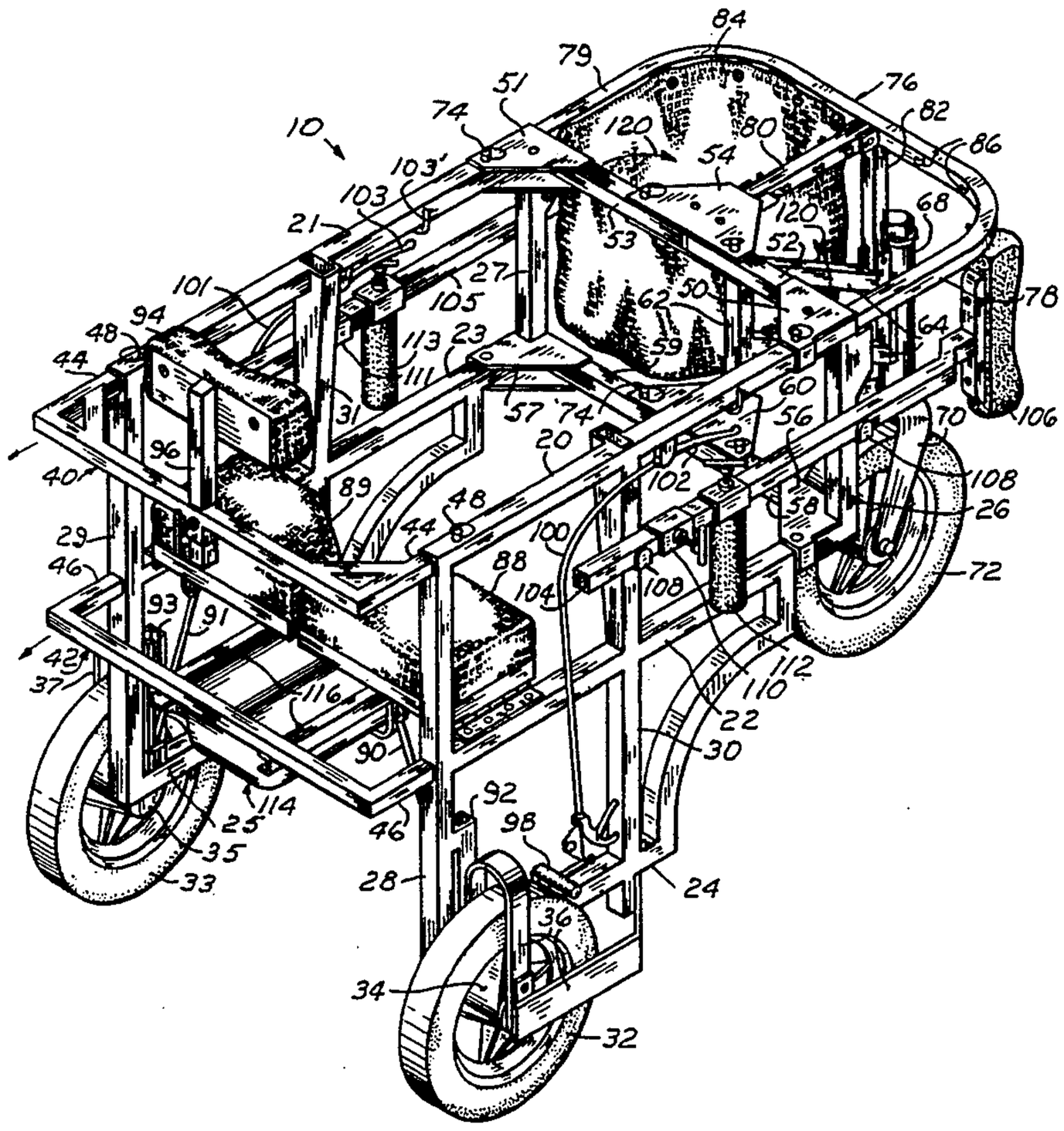
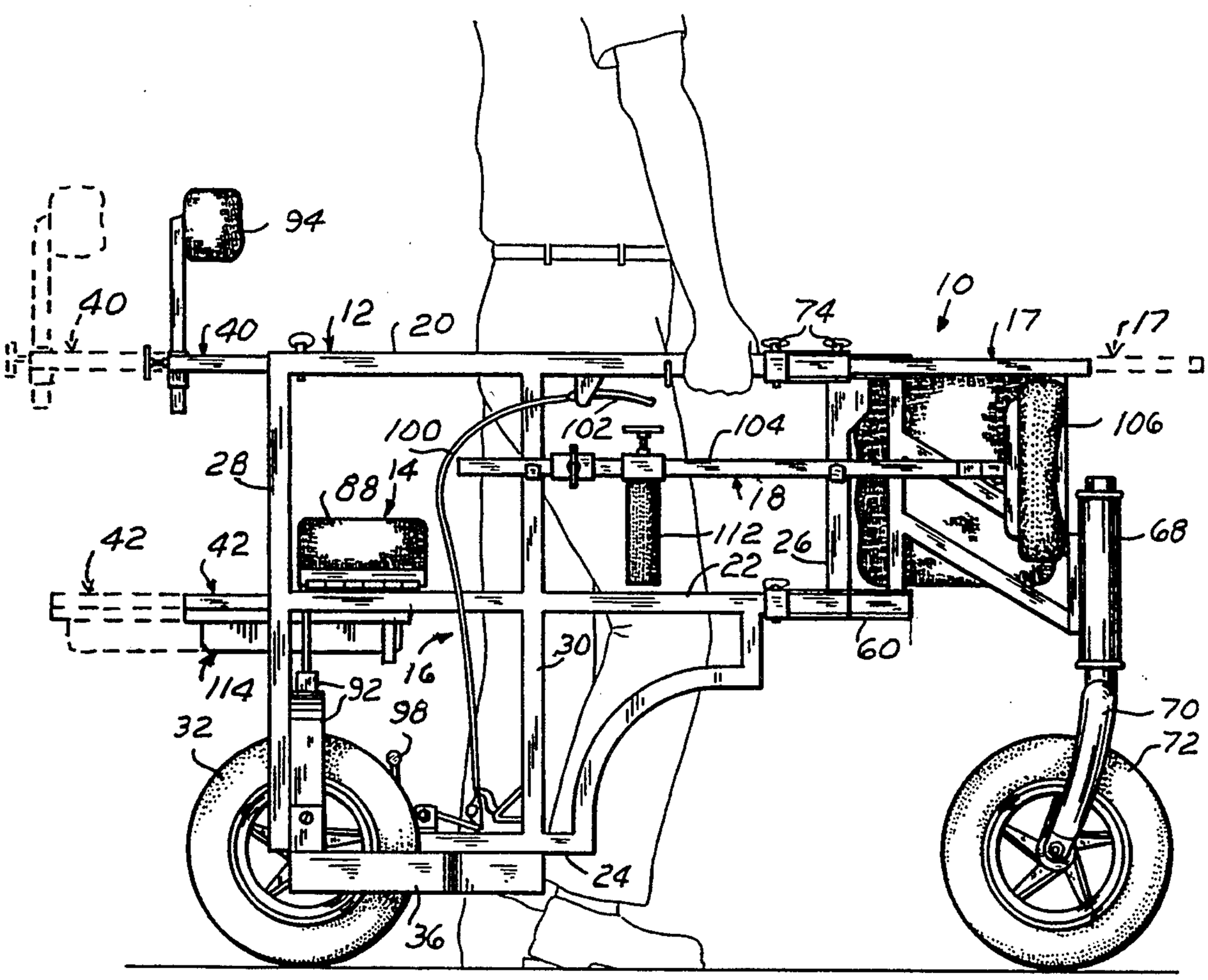
[57] **ABSTRACT**

An ambulatory apparatus for rehabilitating individuals is formed by a rigid foldable tubular frame characterized by an open framework formed by a plurality of horizontal side rails defining forward and rearward ends of the frame. Fixed axle rear wheels and a forward caster wheel support the frame for mobile movement. A foldable seat and back rest at the rearward end of the frame supports the user when seated thereon. The uppermost side rails support the user in a walker fashion and normally stored crutch members supported by the side rails are available for a user needing crutches. Manually operated brake pads are movable toward and away from the rear wheels for anchoring the apparatus or controlling its rate of descent on a downgrade.

1 Claim, 2 Drawing Sheets

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40
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28
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88
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68
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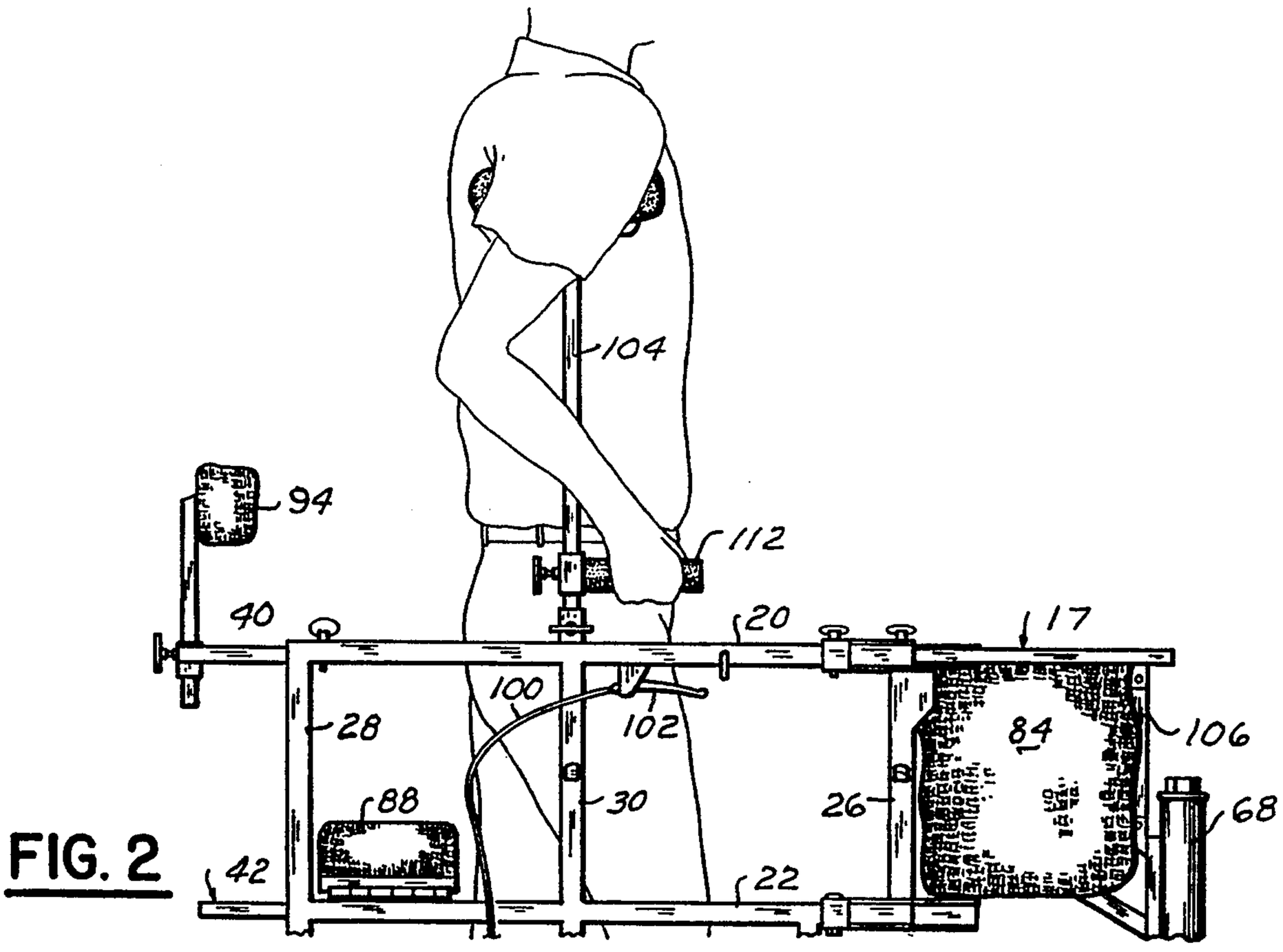
36

FIG. 1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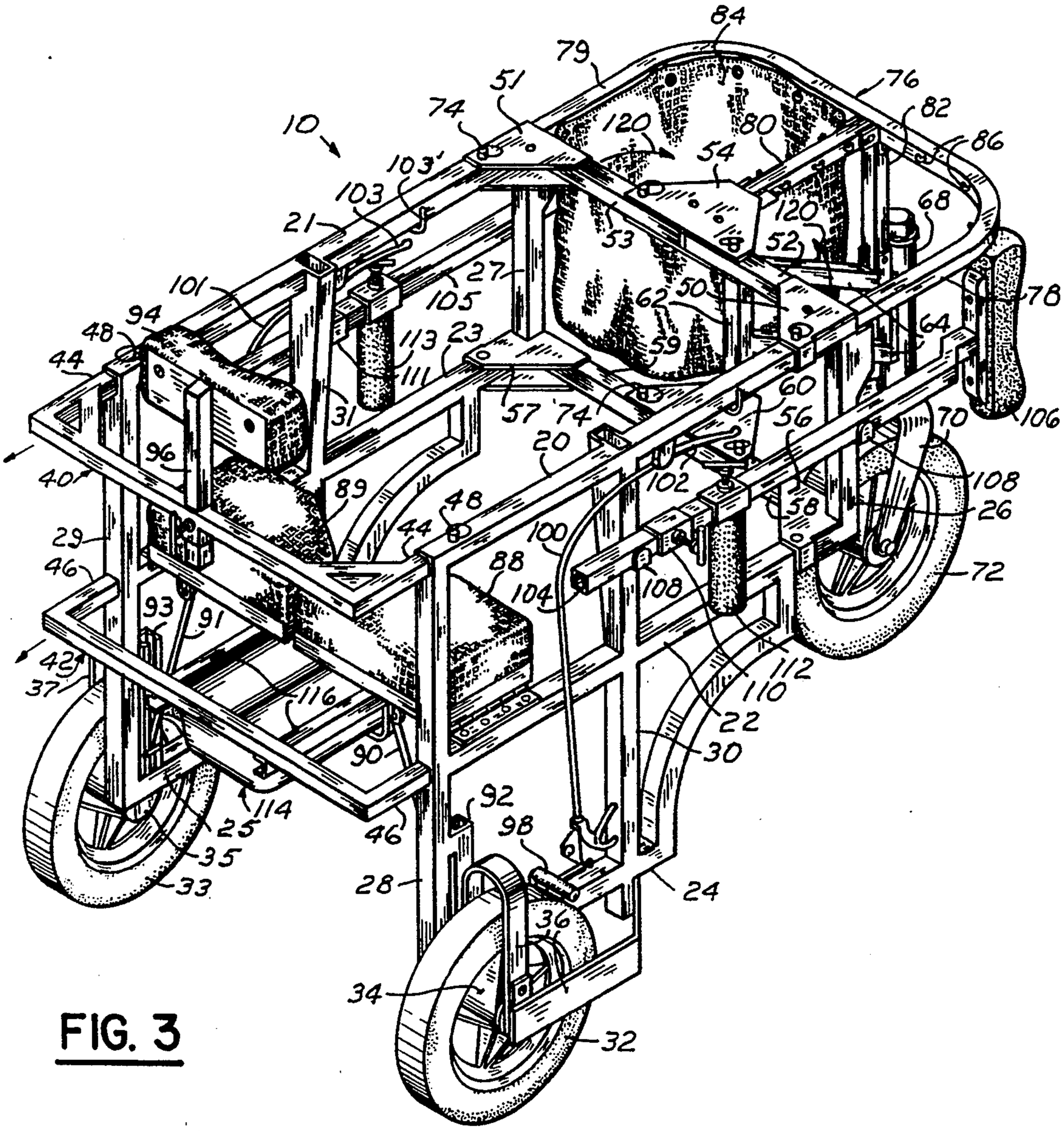
22

FIG. 2


84
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103'
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68
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62
50
78
94
48
113
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64
59
44
111
60
31
57
74
56
70
106
20
96
102
108
40
89
48
58
26
29
44
100
46
88
104
108
72
93
91
112
42
110
37
116
22
90
30
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114
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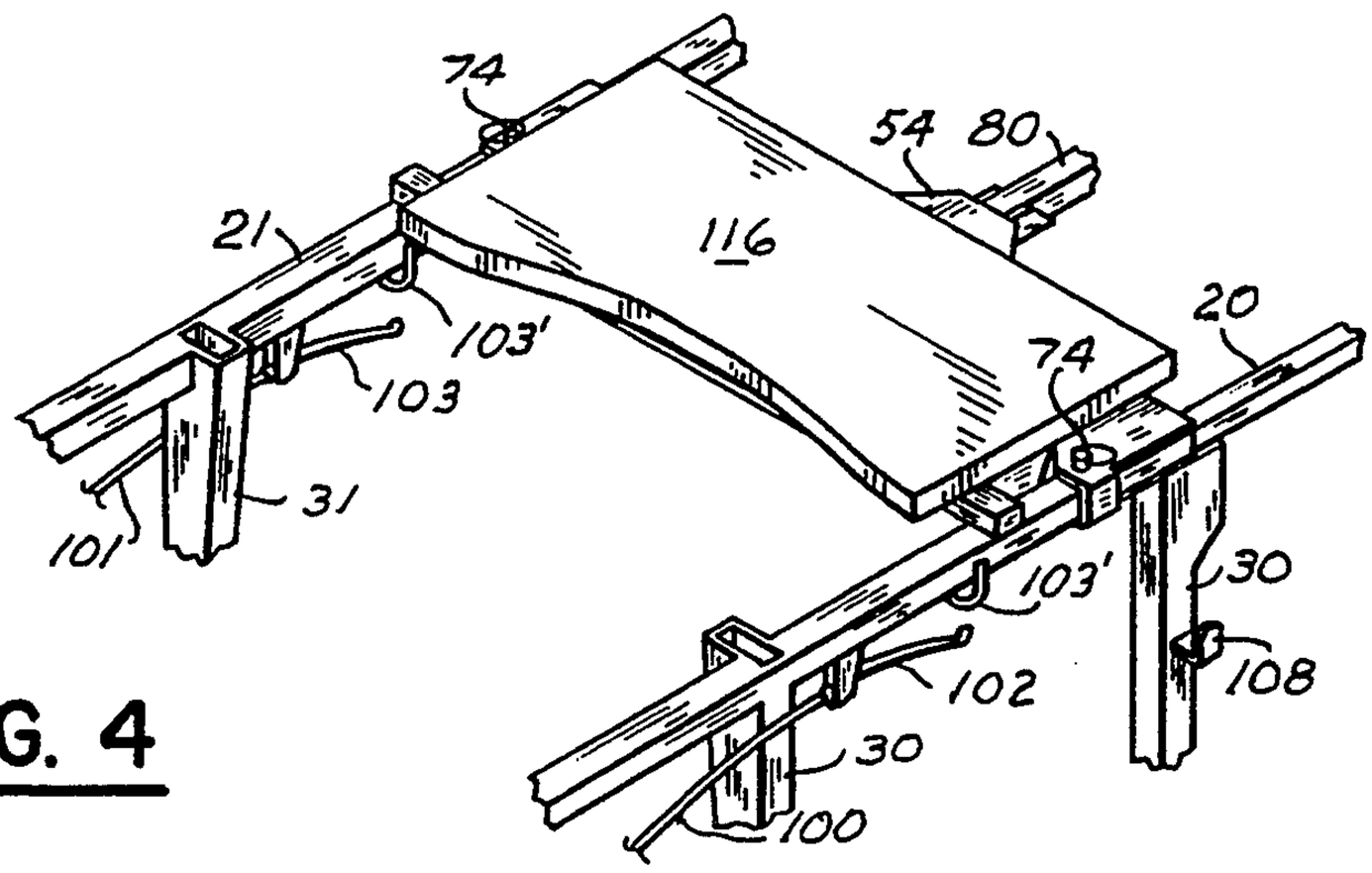
FIG. 3


74
54
80
21
116
20
103'
74
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101
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102
108
30
100

FIG. 4

REHABILITATION APPARATUS FOR AMBULATORY PATIENTS

BACKGROUND OF THE INVENTION

The present invention relates to mobility aides and more particularly to an apparatus for assisting ambulatory patients in moving about.

1. Field of the invention

Walkers and wheel chairs are generally used by the elderly or disabled persons. A walker adds stability and a feeling of assurance to persons unstable when walking and wheelchairs add mobility to the individual capable of manipulating the wheels of the wheel chair.

Neither a walker nor a wheelchair is particularly conducive toward rehabilitating an individual who has suffered a major injury. The walker generally does not include a place or seat for the user to be seated when undergoing rehabilitation and becomes tired and the wheelchair is not conducive toward the individual utilizing or exercising his legs as when walking.

This invention overcomes both of these disadvantages in providing a mobile unit which surrounds the user during rehabilitating exercises providing both a seat, rails and crutches for stability when walking.

2. Description of the prior art

The most pertinent patent is believed to be U.S. Pat. No. 4,277,100, issued Jul. 7, 1981, to Beougher for AMBULATORY APPARATUS. This patent discloses a walker-type up-right open frame of general U-shape in top view featuring a rearward seat and upward and lower rails with fixed axle forward wheels and caster-type rearward wheels. A spring urged brake normally engages the forward wheels, which may be released for free wheel movement of the device.

U.S. Pat. No. 4,187,869, issued Feb. 12, 1980, to Marchetti for ORTHOPEDIC DEVICE discloses an upright frame supported by caster wheels and having an adjustable seat thereon features upstanding crutch arms having shoulder supports at their upper ends and handles at their lower ends, thus, providing a combination walker, a seat for resting and crutches for moving about in an ambulatory manner.

This invention is distinctive over the above named patents by providing a mobile frame which surrounds the user and includes a foldable seat having a back rest and is provided with forward utility baskets and a combination eating and working tray.

U.S. Pat. No. 4,251,105, issued Feb. 17, 1981, to Barker for MOBILITY AID and U.S. Pat. No. 4,861,051, issued Aug. 29, 1989, to Napper for REHABILITATION WALKER DEVICE are considered good examples of the further state-of-the-art.

The Barker patent discloses an upright generally U-shaped, in top view, frame having fixed axle forward wheels which are spring mounted in their supports, so that downward pressure on the frame depresses the frame relative to the wheels to engage forward and downwardly projecting stabilizing struts against the surface of the earth for stability when desired. The frame further features arm supports and a fold down seat. The Napper patent discloses a caster wheel supported frame having forward handle bars for guidance and a rearward seat which is vertically adjustable.

SUMMARY OF THE INVENTION

This invention includes an upright open framework characterized by vertically spaced upper and lower rails

completely surrounding the position of a user and having fixed axle rearward wheels and a caster-type forward wheel utilizing balloon-type tires for ease of mobility.

The rails are hingedly connected together at their forward ends for movement of the frame sides toward and away from each other by removing rearward stabilizing spacers for occupying a minimum of space when in storage or for transport.

Foldable cushioned seats at the rearward limit of the frame overlie a bedpan-type tray while a back support projects above the uppermost stabilizing spacer and patient operated brakes anchor the device or controls its descent on a downgrade.

Normally stored crutches are removably received by upwardly open frame sockets.

The forward portion of the frame supports two basket-type compartments for miscellaneous equipment and a removable tray transversely overlies the forward part of the frame to serve as an eating tray or working surface.

The principal object of this invention is to provide a rehabilitation apparatus having a low center of gravity which may be used as a walker or propelled with one or both feet having sufficiently large wheels for moving over obstacles, such as curbs, with ease and includes crutches for use in supporting a patient while moving the apparatus and having hand brakes for anchoring or retarding movement while negotiating a downgrade and includes baskets for carrying equipment such as groceries and a table tray for eating or paperwork which will enable an individual to rehabilitate themselves and provide individual freedom and independence.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side elevational view of the apparatus in operative position and illustrating by dash lines, telescoping movement of the rearward upper and lower cross members and forward basket rail;

FIG. **2** is a view similar to FIG. **1** illustrating the position of the crutches when in use;

FIG. **3** is a perspective view of the apparatus, per se; and, FIG. **4** is a fragmentary perspective view illustrating the relative position of the eating tray or platform.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral **10** indicates the apparatus as a whole comprising a frame **12** having a seat means **14**, a brake means **16**, compartment means **17** and crutch means **18**.

The frame **12** is generally rectangular in overall configuration preferably formed from rigid tubing material and is characterized by parallel laterally spaced upright side member formed by top or upper rails **20** and **21** and intermediate rails **22** and **23** spaced downwardly in parallel relation with respect to the top rails and bottom rails **24** and **25** spaced downwardly with respect to the intermediate rails.

Vertical forward standards **26** and **27** respectively extend between and are rigidly connected with the top and intermediate rail forward end portions.

Rearward standards **28** and **29** rigidly connect the rearward end portions of the upper, intermediate and bottom rails.

Intermediate standards **30** and **31** similarly extend vertically and interconnect the upper, intermediate and bottom rails.

A pair of rearward wheels **32** and **33** having their respective hubs **34** and **35** journalled on transversely aligned axles, not shown, rigidly connected, respectively, at one end to the outer surface of the depending end portion of the respective rearward standards **28** and **29** with the other end of these axles secured to wheel guards **36** and **37**, respectively, in turn secured to the respective lower rail **24** and **25**.

The rearward end portions of the upper rails **20** and **21** and intermediate rails **22** and **23** are rigidly joined by upper and lower U-shaped horizontal frame cross members **40** and **42**, respectively, each having pairs of legs **44** and **46**, respectively, which respectively enter the rearward ends of the upper rails **20** and **21** and intermediate rails **22** and **23**. Fasteners **48** secure the upper U-shaped member **40** to the upper rails for use of the member **40** as a handle in moving the apparatus.

Upper lateral plate hinges **50** and **51** hingedly connect the forward end portion of the upper rails **20** and **21**, respectively; to one end, respectively, of a pair of upper front frame braces **52** and **53**. Upper center hinge plates **54** hingedly join the abutted ends of the upper front cross members **52** and **53**.

Similarly, lower lateral hinge plates **56** and **57** hingedly join a forward end portion of the intermediate rails **22** and **23** to a lower pair of front cross members **58** and **59**. Lower center frame hinge plates **60** hingedly join the abutted ends of the lower frame cross members **58** and **59**.

A front wheel strut **62** extends vertically between and is rigidly secured at its respective ends to the confronting plates of the upper and lower center hinges **54** and **60**. Vertically spaced parallel forward and downwardly inclined front wheel brace members **64** are rigidly connected at one end to the front wheel strut **62** and rigidly connected at their other ends to a sleeve **68** journalling the shaft of a bicycle-type front wheel fork **70** on a vertical axis, in turn, journalling a front wheel **72** in caster fashion.

Hinge lock pins **74** join the plate **50, 51, 54** and **60** hinges to selected frame members to permit a folding movement of the frame **12** as hereinafter explained.

A forward U-shaped horizontal basket rail **76** having parallel legs **78** and **79** supported at their rearward end portions by the front standards **26** and **27**, respectively, is further provided with a center rail **80** connected at one end with the bight portion of the basket rail and removably supported at its other end portion by the top center hinge plates **54**.

A third leg **82** of the basket rail is connected with its bight portion in vertical depending relation and has its depending end bifurcated for straddling in supporting relation the uppermost wheel rail **64**, thus, forming a pair of basket compartments respectively receiving a fabric basket **84** removably connected at their upper open end edges with a series of hooks **86** on the inner edge surfaces of the basket rail **76** and its leg **80**.

The seat means **14** comprises a pair of horizontal padded seat panels **88** and **89** hingedly connected in transversely aligned relation by hinges to the rearward end portion of the respective intermediate side rails **22** and **23** adjacent the rearward standards **28** and **29**, respectively, and substantially above the fixed rear wheel axis to lower the frame center of gravity. The inner end portion of the respective padded seat **88** and **89** is supported by a hingedly connected angularly disposed rod **90** and **91**, respectively extending downward and outward for vertical sliding engagement with slotted guide tubes **92** and **93** respectively secured vertically to the forward depending end portion of the rearward standards **28** and **29**, thus, permitting the seats **88** and **89** to be vertically pivoted about the horizontal axis of the respective hinge for the reasons presently explained. The seat means **14** further includes a back support pad **94** centrally supported by a vertical strut adjustably secured to the bight portion of the top U-shaped member **40**.

The brake means **16** comprises a pair of brake pads **98**, only one being shown, disposed adjacent the periphery of the rear wheels **32** and **33** which are actuated by a pair of Bowden cables **100** and **101** controlled by operator actuated handles **102** and **103**. Brake handle locks **103'** on the respective top rail maintains the wheels brake locked when desired.

The crutch means **18** comprises a pair of tubular shafts **104** and **105** having a shoulder pad **106**, only one being shown, at one end portion, normally horizontally supported by brackets **108** attached to the forward and intermediate standards of the frame sides. When in use the crutch shafts **104** and **105** are inserted at their ends opposite the shoulder pads into the upper open end of the intermediate standards **30** and **31**. The shoulder pads are maintained in a selected elevated position by sleeves **110** and **111** adjustably secured to the respective crutch shaft. Handles **112** and **113** slidably adjustable vertically on the crutch shaft enable the operator to use the crutches and move the apparatus **10** in a mobile manner while walking with the crutches.

The apparatus **10** further includes a rectangular upwardly open container **114** having outwardly projecting parallel flanges which are slidably received in grooves formed by a pair of channel members **116** secured at one end portion in parallel forwardly projecting a relation to the bight portion of the lower U-shaped member **42** to normally dispose the tray below the position of the padded seat members **88** and **89**.

Additionally, the apparatus **10** includes an eating or serving tray **116** generally rectangular in overall configuration which extends transversely of the frame **12** adjacent the forward limit of the upper rails **20** and **21** and is supported at its forward limit by the upper center hinge member **54** and its components.

Operation

In operation, a user enters the frame **12** by removing the rearward U-shaped members **40** and **42** and pivoting the padded seats upwardly toward the respective top rail **20** and **21**. After entering the frame, the U-shaped members **40** and **42** are replaced to the position illustrated by FIGS. **1** and **3** and the seats pivoted downwardly if used.

Thereafter, the user while seated on the seat may be moved by an attendant grasping the bight portion of the member **40** or, if capable of foot movement, may propel himself by the feet contacting the surface on which the device rests, being guided also by foot movement. Alternatively, if the patient needs to exercise in a walking position he grasps the top rails **20** and **21**, as illustrated by FIG. **1**, for movement of the apparatus. If one of his legs is incapacitated, the crutch means **18** is positioned,

as shown by FIG. 2 and as described hereinabove, for moving about with the use of the crutches.

A further feature of the apparatus **10** is that it may be stored in a relatively small area by collapsing the frame which is accomplished by removing the U-shaped members **40** and **42**, the basket top rail **76** and the hinge plate fastening pins **74** so that the pairs of top front members **52, 53, 58** and **59** may pivot about their hinge connection with the plate hinge members **54** and **60** in the directions of the arrows **120**, thus, permitting the side rail members to move toward each other as individual units and occupy a minimum of space transversely.

Obviously the invention is susceptible to changes or alterations without defeating its practicability. Therefore, I do not wish to be confined to the preferred embodiment shown in the drawings and described herein.

I claim:

1. A mobile rehabilitation apparatus, comprising:

frame means including

a pair of vertically spaced upper and lower tubular side rails which are interconnected by standards at each end of the rails, each said pair of side rails is laterally spaced and interconnected at their respective forward ends by pairs of upper and lower front cross members, each pair of said pairs of front cross members being pivotally connected together in longitudinal alignment during normal usage by a center hinge, said side rails being separably interconnected at their respective rearward ends by upper and lower U-shaped cross members having parallel legs removably received telescopically by the respective upper and lower frame side rail, said standards are connected in a manner to form a pair of forward standards and a pair of rearward standards, and said frame means forms a vertically open frame for surrounding a user;

basket means including a horizontal forward u-shaped basket rail having parallel legs removably supported telescopically by the forward end portions of said upper side rails for precluding pivoting movement of said upper and lower pairs of front cross members during normal usage;

wheel means including a pair of rear wheels mounted on a fixed axis extending transversely of said frame means adjacent the depending end portions of said rearward standards and a forward caster wheel means secured to said forward frame cross members center hinges; and,

seat means including a pair of cushion seats hingedly connected respectively with said lower side rails and normally extending transversely of said frame means adjacent the lower rearward frame cross member above the rear wheels fixed axis for forming a low center of gravity for said frame means when occupied by a user,

whereby the frame means may be laterally collapsed without extending its overall longitudinal length by removing the basket means rail and the rearward U-shaped cross members and manually juxtaposing the upper and lower side rails by the center hinge connected end portion of the respective pair of upper and lower front cross members center hinges pivoting rearwardly.

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